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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/628,191	07/28/2003	John Tufts	1030-21400	6083

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EXAMINER

GAY, JENNIFER HAWKINS

ART UNIT	PAPER NUMBER
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3672

DATE MAILED: 04/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/628,191	Applicant(s) TUFTS, JOHN	
	Examiner Jennifer H Gay	Art Unit 3672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-21 and 23-36 is/are rejected.
- 7) ☒ Claim(s) 7 and 22 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/28/03, 10/25/04</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 57a, 181, and 281. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 100, 193, 320, and E. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The abstract of the disclosure is objected to because the abstract includes the implied phrase "is disclosed", purported merits in the phrase "as to enhance formation removal", and has

been constructed as a single run-on sentence instead of a narrative paragraph. Correction is required. See MPEP § 608.01(b).

4. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

5. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means"

Art Unit: 3672

and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Objections

6. Claim 12 is objected to because of the following informalities: Claim 12 recites the limitation "said radius R" in line 1. There is insufficient antecedent basis for this limitation in the claim.. Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 13, 14, and 19-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 13, 14, 19, and 23 are considered indefinite because it is not clear from the claim language as to what a "wedge ratio" is. Without the recitation of what dimensions or features of the back surface or top cutting profile are being compared, the phrase "wedge ratio" has little meaning. For the purposes of examination, the examiner is assuming that a "wedge ratio" is ratio of the radius of the nose of the cutter to the radius of the back surface at the trailing end opposite the nose.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-4, 8-10, 16-18, 20, 24-26, 28-34, and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Steinke et al. (US 6,241,034).

Regarding claims 1, 18: Steinke et al. discloses a cutter element for a drill bit that includes the following features:

- A base portion having a central axis.
- A cutting portion extending from the base portion and having a cutting surface that terminates in a rounded nose that is spaced apart from the central axis. The cutting surface has a front surface, a back surface, and a pair of flanking surfaces extending from the base and intersecting at the nose (Figures 9A-9C; the examiner acknowledges that the reference does not provide a specific description of the above figures but notes that all of the above features and those described below are clearly shown in Figures 9A-9C).
- At least one of the flanking surfaces includes a concave region (Figure 9A).
- The back surfaces slopes from the nose to the base portion and is broader adjacent the base than adjacent the nose forming a wedge-shaped top cutting profile.

Regarding claims 2, 24: The cutting surface also includes a wedge-shaped side profile.

Regarding claims 3, 26, 31: Each of the flanking surfaces is concave.

Regarding claims 4, 31: The nose is spherical.

Regarding claims 8, 33: The concave region has an elongated shape that extends in a direction toward the nose.

Regarding claims 9, 25, 36: The back surface is symmetrical about a plane of symmetry that bisects the back surface (Figure 9A). The intersection of the plane and the back surface define a crown line. The back surface is continuously contoured from the crown line to the intersection of the back surface and flanking surfaces.

Regarding claim 10: The back surface is continuously contoured from the nose to the base.

Regarding claims 16, 20, 34: The top profile is a generally triangular shape.

Regarding claims 17, 28: The base portion includes an outer surface defining an outer profile of the base where the nose extends beyond the outer profile.

Regarding claim 18: The back surface has a leading end at the nose and a trailing end opposite from the nose where the back surface is wider at a location adjacent to the trailing end than at the leading end.

Regarding claim 24: The back surfaces slopes away from the nose toward the trailing end.

Regarding claim 29: Steinke et al. further teaches using the above cutter element in a drill bit that includes the following features (Figures 1 and 2):

- A bit body having a bit axis.
- At least one rolling cone cutter rotatably mounted on the bit body and having a plurality of cutter elements disposed in spaced-apart circumferential rows.
- A gage row of cutter elements having cutting portions extending to full gage diameter for cutting the corner of the borehole.
- An inner row of cutter elements disposed radially inboard of the gage row for cutting the borehole bottom where the inner row cutter elements are the cutter elements described above.

Regarding claim 30: The back surface is at least three times wider adjacent the trailing end than at the leading end.

Regarding claim 32: The inner row cutter elements are positioned in the cutter cone so that the front surface engages the formation material before the back surface. The examiner notes that this is not specifically taught, however this is inherently how a cutter element would be positioned on any cutter cone.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 5, 6, 11, 12, 15, 21, 26, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Steinke et al. (US 6,241,034) in view of Portwood et al. (US 6,059,054).

Regarding claim 5 and 6: Steinke et al. discloses all of the limitations of the above claims except for the specific teaching of the side profile of the cutter element having a first segment with a radius R_1 adjacent the nose, a middle segment with a radius R_2 that is greater than R_1 , and a trailing segment with a radius R_3 that is greater than R_2 or greater than R_1 but less than R_2 .

Portwood et al. discloses a cutter element that is similar to that of Steinke et al. In Figures 11D and 11E Portwood et al. further teaches that the side profile of the cutter element has a first segment with a radius R_1 (r_L) adjacent the nose, a middle segment with a radius R_2 (not specifically labeled) that is greater than R_1 , and a trailing segment with a radius R_3 (r_T) that is greater than R_2 (Figure 11D) or greater than R_1 but less than R_2 (Figure 11E). (11:10-45)

It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have modified the cutter element of Steinke et al. such that the side profile of the cutter element had a first segment with a radius R_1 adjacent the nose, a middle segment with a radius R_2 that is greater than R_1 , and a trailing segment with a radius R_3 that is greater than R_2 or greater than R_1 but less than R_2 as taught by Portwood et al. in order to have reduced potential damaging tensile stress in the cutter element thus increasing the life of the bit (3:50-67).

Regarding claims 11, 12, and 26: Steinke et al. discloses all of the limitations of the above claims except for the nose being set back from the outer profile of the base portion by a distance D that is at least equal to the radius of the nose.

Portwood et al. further teaches a nose that is set back from the outer profile of the base portion of the cutter element by a distance D where D appears to be approximately equal to the radius of the nose (Figure 10C).

It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have modified the cutter element of Steinke et al. such that the nose was set back from the outer profile of the base portion by a distance D that is at least equal to the radius of the nose as taught by Portwood et al. in order to have reduced potential damaging tensile stress in the cutter element thus increasing the life of the bit (3:50-67).

Regarding claims 15, 21, and 35: Steinke et al. discloses all of the limitations of the above claims except for the top profile of the cutter element being pear-shaped.

In Figures 3B and 4B, Portwood et al. further teaches a cutter element that has a pear-shaped top profile.

It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have modified the cutter element of Steinke et al. such that the top profile was pear-shaped as taught by Portwood et al. in order to have provided a cutter element with a top profile shape that provided a larger contact surface with the borehole wall thus increasing the cutting rate of the cutter element.

13. Claims 13, 14, 19, and 23 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Steinke et al. (US 6,241,034).

While Steinke et al. does not specifically teach the top cutting profile having a wedge ratio of at least 3 to 1 and the back surface having a wedge ratio of at least 3 to 1, this feature is considered to be inherently taught by Figures 9A and 9B. There it can be seen that there is a large difference in the radius of the nose and the radius of the back surface at the trailing end.

If applicant traverses the above rejection, the following, alternate rejection is provided.

Steinke et al. discloses all of the limitations of the above claims except for the top cutting profile specifically having a wedge ratio of at least 3 to 1 and the back surface specifically having a wedge ratio of at least 3 to 1. While these ratios are not specifically taught, it would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have formed the cutter element of Steinke et al. such that the top cutting profile had a wedge ratio of at least 3 to 1 and the back surface had a wedge ratio of at least 3 to 1, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Allowable Subject Matter

14. Claims 7 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

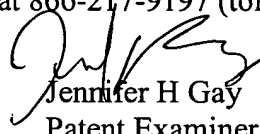
The remaining references made of record disclose various drill bit cutting elements.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer H Gay whose telephone number is (571) 272-7029. The examiner can normally be reached on Monday-Thursday, 6:30-4:00 and Friday, 6:30-1:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell can be reached on (571) 272-6999. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 3672

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jennifer H Gay
Patent Examiner
Art Unit 3672



JHG
April 26, 2005